RUST GEOTECH INC.

Spectral Gamma-Ray Borehole
Log Data Report

Borehole 51-15-07

Log Event A

Borehole Information

Farm : TX	**Tank :** TX-115	**Site Number :** 299-W15-119
N-Coord : 41,923	**W-Coord :** 75,982	**TOC Elevation :** 668.65
Water Level, ft :	**Date Drilled :** 3/31/1970	

Casing Record

Type : Steel-welded	Thickness : 0.280	ID, in. : 6
Top Depth, ft. : 0	Bottom Depth, ft. : 95	

Borehole Notes:
According to the driller's records, this borehole was not perforated or grouted. The casing thickness is presumed to be 0.280 in., on the basis of the published thickness for schedule-40, 6-in. steel tubing.

Equipment Information

Logging System : 1	**Detector Type :** HPGe	**Detector Efficiency:** 35.0 %
Calibration Date : 10/1995	**Calibration Reference :** GJPO-HAN-3	**Logging Procedure :** P-GJPO-1783

Log Run Information

Log Run Number :	1	**Log Run Date :**	2/15/1996	**Logging Engineer:**	Alan Pearson
Start Depth, ft.:	99.0	**Counting Time, sec.:**	100	**L/R :** L	**Shield :** N
Finish Depth, ft. :	46.0	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Log Run Number :	2	**Log Run Date :**	2/16/1996	**Logging Engineer:**	Alan Pearson
Start Depth, ft.:	47.0	**Counting Time, sec.:**	100	**L/R :** L	**Shield :** N
Finish Depth, ft. :	0.0	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Log Run Number :	3	**Log Run Date :**	2/16/1996	**Logging Engineer:**	Alan Pearson
Start Depth, ft.:	0.0	**Counting Time, sec.:**	100	**L/R :** L	**Shield :** N
Finish Depth, ft. :	10.0	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Borehole 51-15-07

Log Event A

Analysis Information

Analyst : S.D. Barry

Data Processing Reference : P-GJPO-1787 Analysis Date : 12/3/1996

Analysis Notes :

This borehole was logged in three log runs with one section relogged for quality assurance. The pre-survey field verification spectra from both log runs did not pass the acceptance criteria established for the peak shape and system efficiency. A nonconformance report issued in August 1996 (N-96-05) identified this failure as a power supply malfunction that resulted in a low detector bias voltage supplied to the logging tool. This malfunction occurred in the mornings immediately following system start-up, but ceased after an extra long warm-up period (about 1 to 2 hours). This report also documents that concentrations calculated from data collected in the first 2 hours of logging could be systematically understated by about 10 percent. Therefore, the data from log runs 1 and 2 may show a repeatability problem upon relogging of the borehole in the future.

The post-survey field verification spectra for both log runs passed the acceptance criteria for the peak shape and system efficiency, providing evidence that the logging system was operating appropriately after an initial warm-up time. The energy calibration and peak-shape calibration from verification spectra that successfully met the established acceptance criteria were used to establish the channel-to-energy parameters used in processing the spectra acquired during the logging operation. Corrections for gain drifts during data collection were not necessary during processing of the data to maintain proper peak identification.

Casing correction factors for a 0.280-in.-thick steel casing were applied during analysis.

The only man-made radionuclide detected in this borehole was Cs-137. The Cs-137 contamination was measured almost continuously from the ground surface to about 15 ft, between 17.5 and 22 ft, and intermittently to the bottom of the borehole. Two regions of interest can be identified from the plot: between the ground surface and 10 ft and between 17.5 and 22 ft. The maximum Cs-137 concentration is 29 pCi/g at 1 ft.

K-40 concentrations begin to increase at about 47 ft. The Th-232 and U-238 concentration values begin to increase at about 95 ft.

The interval between 0 and 10 ft was relogged to check the quality of the radionuclide concentration measurements made by the SGLS. The concentrations of the man-made and natural radionuclides were calculated using the separate data sets at the overlapping depths. The concentrations of these radionuclides were within the statistical uncertainty of the measurements, verifying the excellent repeatability of the radionuclide concentration measurements.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Report for tank TX-115.

Log Plot Notes:

Separate log plots show the man-made (Cs-137) and the naturally occurring (KUT) radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the

Borehole 51-15-07

Log Event A

spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A rerun plot was generated for the region between 0 and 10 ft. The radionuclide concentrations shown were calculated using the separate data sets provided by the original and rerun logging runs.